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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,865	03/12/2004	Rolf Weis	8055-147 (02 P 03330 US)	9067
48154	7590	11/16/2005		
SLATER & MATSIL LLP 17950 PRESTON ROAD SUITE 1000 DALLAS, TX 75252			EXAMINER SMOOT, STEPHEN W	
			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary

Application No.

10/798,865

Applicant(s)

WEIS, ROLF

Examiner

Stephen W. Smoot

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004 and 14 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 11 and 22 is/are allowed.
- 6) ☒ Claim(s) 5-10 and 12-20 is/are rejected.
- 7) ☒ Claim(s) 21 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is in response to application papers filed on 12 March 2004 and to applicant's preliminary amendment filed on 14 December 2004.

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference characters not mentioned in the description: 118 in Fig. 1C.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 7-9, 20-21, 23 are objected to because of the following informalities:

In claim 7, line 1, change "polysilicon stud" to --poly stud-- for proper antecedence to claim 1, line 2;

In claim 8, line 1, change "polysilicon stud" to --poly stud-- for proper antecedence to claim 1, line 2;

In claim 9, line 1, change "polysilicon stud" to --poly stud-- for proper antecedence to claim 1, line 2;

In claim 20, line 1, change "poly stud" to --polysilicon stud-- for proper antecedence to claim 11, line 6;

In claim 20, line 2, change "poly stud" to --polysilicon stud-- for proper antecedence to claim 11, line 6;

In claim 21, line 2, change both appearances of "poly stud" to --polysilicon stud-- for proper antecedence to claim 11, line 6; and

In claim 23, line 1, change the claim dependency from "claim 20" to --claim 22-- because claim 22 has antecedence for "the conductive stud", "the liner", "the conductor", and "the top insulator".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-10, 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the etch support nitride liner" in line 3;

Claim 6 recites the limitation "the memory device " in line 3;

Claim 6 recites the limitation "the substrate" in line 6;

Claim 7 recites the limitation "the top oxide in the support" in line 6;

Claim 8 recites the limitation "the polysilicon cap" in line 3;

Claim 9 recites the limitation "the organic planarization coating" in line 3;

Claim 10 recites the limitation "the polysilicon cap" in line 2;

Claim 12 recites the limitation "the deep trench memory device" in line 3;

Claim 13 recites the limitation "the polysilicon in the support" in line 3;

Claim 13 recites the limitation "the top oxide in the support" in line 4;

Claim 14 recites the limitation "the polysilicon cap" in line 3;

Claim 15 recites the limitation "the organic planarization coating" in line 3;

Claim 16 recites the limitation "the polysilicon cap" in line 2;

Claim 17 recites the limitation "forming a nitride liner" in line 1;

Claim 18 recites the limitation "forming a nitride liner" in line 1;

Claim 19 recites the limitation "the semiconductor device" in line 1; and

Claim 20 recites the limitation "the isolation region" in line 2.

There is insufficient antecedent basis for these limitations in claims 5-10, 12-20.

Allowable Subject Matter

5. Claims 1-4, 11, 22 are allowed.

6. Claims 21, 23 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.

7. The following is a statement of reasons for the indication of allowable subject matter:

- Claims 1-4 are allowed because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method for forming a top oxide for a semiconductor device that includes forming a nitride liner over a poly stud that is above a polysilicon fill in a deep trench, combined with the steps of depositing the top oxide over the semiconductor device and forming a planarization coating over the top oxide;

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- Claim 11 is allowed and claim 21 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method for forming a top oxide for a vertical transistor device that includes forming a liner over a polysilicon stud that is above a deep trench that is filled with doped polysilicon, combined with the steps of depositing the top oxide over the vertical transistor device and forming a planarization coating over the top oxide; and
- Claim 22 is allowed and claim 23 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method of forming a semiconductor device that includes forming a liner over a conductive stud that is formed in at least an upper portion of a trench that is formed in a semiconductor body, combined with the steps of depositing a top insulator over the semiconductor body and forming a planarization layer over the top insulator.

Conclusion

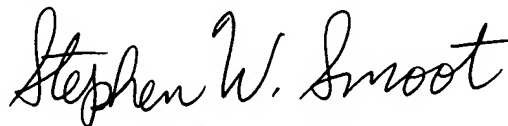
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Horak et al., Nitayama et al., Shen, Scholz et al., Weis, and Divakaruni et al. teach methods of forming vertical transistors.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

A handwritten signature in black ink that reads "Stephen W. Smoot". The signature is written in a cursive, flowing style.

STEPHEN W. SMOOT
PRIMARY EXAMINER